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ARS 58 (2012) (English): White sugar _
Specification



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White sugar — Specification



Table of contents

1	Scope.....	1
2	Normative references	1
3	Definitions	2
4	Requirements	3
4.1	General requirements.....	3
4.2	Compositional requirements.....	3
5	Food additives	3
6	Metal contaminants.....	4
6.1	Pesticide residues.....	4
6.2	Metals	4
6.3	Mycotoxins.....	4
7	Hygiene.....	4
7.1	General requirements.....	4
8	Packaging	5
9	Labelling.....	5
10	Method of sampling	5
10.1	General requirements for sampling	5
10.2	Scale of sampling	6
10.3	Preparation of sample.....	6
11	Methods of test — Determination of pesticide residues.....	6
	Bibliography	7

Foreword

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Introduction

This African Standard is a technical revision of the earlier ARS 58:1986(E), *White sugar — Specification* which is hereby superseded and cancelled.

White sugar — Specification

1 Scope

This African Standard specifies the requirements, methods of sampling and testing for white sugar (plantation or mill white sugar and refined white sugar) intended for human consumption.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ARS 53, *General principles of food hygiene — Code of practice*

ARS 56, *Prepackaged foods — Labelling*

CODEX Stan 192, *General standard for food additives*

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

ICUMSA Method GS 2/3-1, *The Braunschweig Method for the Polarisation of White Sugar by Polarimetry — Official (Reference) Method*

ICUMSA Method GS 2/3/9-5, *The Determination of Reducing Sugars in Purified Sugars by the Knight and Allen EDTA Method — Official (Reference) Method*

ICUMSA Method GS 2/9-6, *The Determination of Reducing Sugars in White Sugar and Plantation White Sugar by the Modified Ofner Titrimetric Method — Official*

ICUMSA Method GS 3/4/7/8-11, *The determination of sulphated ash in brown sugar, juice, syrup and molasses*

ICUMSA Method GS 2/3/9-17, *The Determination of Conductivity Ash in Refined Sugar Products and in Plantation White Sugar — Official*

ICUMSA Method GS 2/1/3/9-15, *The Determination of Sugar Moisture by Loss on Drying*

ICUMSA Method GS 9/1/2/3-8, *The Determination of Sugar Solution Colour at pH 7.0 by the MOPS Method*

ICUMSA Method GS 2/3/9-19, *The determination of insoluble matter in white sugar by membrane filtration*

ICUMSA Method GS 2/1/3-27, *The determination of lead in sugar products by a colorimetric method*

ICUMSA Method GS 2/3-24, *The Determination of Lead in Sugars and Syrups by a GFAAS Method*

ICUMSA Method GS 2/3-29, *The Determination of Copper in Refined Sugar Products by a Colorimetric Method*

ICUMSA Method GS 2/3/9-25, *The Determination of Arsenic in Refined Sugar Products by a Colorimetric Method*

CD-ARS 58:2012(E)

ICUMSA Method GS 2/1/7/9-33, *The Determination of Sulphite by the Rosaniline Colorimetric Method in White Sugar — Official (Reference) Method; in VVHP** Raw Sugar — Tentative; in Cane Sugar Juices and Syrups — Accepted; and in Plantation White Sugar — Accepted*

ISO 4832, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique*

ISO 4833, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of microorganisms — Colony-count technique at 30 degrees C*

ISO 6579, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Salmonella spp.*

ISO 6888-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Technique using Baird-Parker agar medium*

ISO 6888-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 2: Technique using rabbit plasma fibrinogen agar medium*

ISO 6888-3, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 3: Detection and MPN technique for low numbers*

ISO 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*

ISO 21527-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 2: Colony count technique in products with water activity less than or equal to 0.95*

ISO 21567, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Shigella spp.*

3 Definitions

For the purpose of this standard the following definitions apply.

3.1

plantation white sugar

mill white sugar

white sugar commonly manufactured by the vacuum-pan-process from sugar cane

3.2

refined white sugar

purified and granulated sugar, manufactured from any raw sugar, such as plantation (mill) sugar, by the process of purification consisting broadly of affination, melting, chemical treatment, filtration, decolourisation and recrystallisation

3.3

ICUMSA unit

international unit developed by International Commission for Universal Methods of Sugar Analysis (ICUMSA) for expressing the purity of sugar and is directly related to the colour of sugar

3.4

polarisation

estimate of the sucrose content of sugar expressed as degrees of polarization

3.5**lot**

collection of packages of the same size, type and style which have been manufactured and packaged under essentially the same conditions

4 Requirements**4.1 General requirements**

White sugar shall be

- a) in the form of uniform crystals;
- b) free from dirt, foreign and extraneous matter; and
- c) free from fermented, musty or undesirable odours.

4.2 Compositional requirements

White sugar shall conform to the compositional in Table 1.

Table 1 — Composition requirements for white sugar

S No	Characteristic	Requirement/limit		Methods of test
		Plantation white	Refined white	
i.	Polarisation, °Z, min.	99.5	99.7	ICUMSA GS 2/3-1
ii.	Invert sugar content, % m/m, max.	0.1	0.04	ICUMSA GS 2/3/9-5 ICUMSA GS 2/9-6
iii.	Ash, percent, % m/m max.			
	(a) Sulphate ash	0.06	0.06	ICUMSA GS 3/4/7/8-11
	(b) Conductivity ash	0.08	0.04	ICUMSA GS 2/3/9-17
iv.	Moisture content (loss on drying for 3 h at 105 °C ± 2 °C), max. ^{a)}	0.1	0.05	ICUMSA GS 2/1/3/9-15
v.	Colour, in ICUMSA units, max	150	60	ICUMSA GS 9/1/2/3-8
vi.	Sulphur dioxide, mg/kg, max.	20	15	ICUMSA GS 2/1/7/9-33
vii.	Water insoluble matter, mg/kg, max.	150	—	ICUMSA GS 2/3/9-19
^a Does not apply to white sugar in lump or cube form or to crystal candy sugar (crystal korizato) or to rock sugar (korizato), or to powdered sugar (icing sugar) to which starch has been added				

5 Food additives

5.1 White sugar shall contain only permitted additives complying with CODEX STAN 192.

5.2 Anti caking agents: maximum level of 1.5 m/m singly or combination of following agents is permitted to used in white sugar.

- (i) Calcium phosphate, tribasic
- (ii) Magnesium carbonate

CD-ARS 58:2012(E)

- (iii) Silicon dioxide, amorphous (dehydrated silica gel)
- (iv) Calcium silicate
- (v) Magnesium trisilicate
- (vi) Sodium aluminosilicate
- (vii) Calcium aluminosilicate

6 Metal contaminants

6.1 Pesticide residues

White sugar shall conform to the maximum residue limits established by the Codex Alimentarius Commission for this commodity.

6.2 Metals

Milled maize products shall comply with those maximum limits for heavy metals established by the Codex Alimentarius Commission for this commodity. The maximum permitted levels for metal contaminants shall be as set out in Table 2.

Table 2 — Maximum levels for metal contaminants

	Parameter	Requirement	ICUMSA Method of test
i.	Arsenic (As) mg/kg, max	0.5 mg/kg	GS 2/3/9-25 (2007)
ii.	Copper (Cu) mg/kg, max	2 mg/kg	GS 2/3-29 (1994)
iii.	Lead (Pb) mg/kg, max	0.5 mg/kg	GS 2/3/9-25 (2007)

6.3 Mycotoxins

White sugar shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity (see CODEX STAN 193).

7 Hygiene

7.1 General requirements

White sugar shall be prepared and handled in accordance with the requirements of ARS 53.

7.2 When tested by appropriate methods of sampling and examination, the product:

- shall be free from microorganisms in amounts which may represent a hazard to health;
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

6.3 The product shall be free from pathogenic micro-organism and shall comply with microbiological limits in Table 3.

Table 3 — Microbiological limits for white sugar

S/N	Micro-organism(s)	Requirements	Method of test
1	Total plate count, cfu/g	10^3	ISO 4833
2	<i>Staphylococcus aureus</i> cfu/g max	10^2	ISO 6888
3	<i>Escherichia coli</i> , cfu/g, max.	30	ISO 7251
4	<i>Salmonella</i> , per 25g, max.	Not detected	ISO 6579
5	<i>Shigella</i> , cfu/g, max.	Not detected	ISO 21567
6	Yeasts and moulds, cfu/g, max.	50	ISO 21527-2
7	<i>Streptococcus hemolytica</i> , cfu/g, max.	Not detected	

8 Packaging

8.1 White sugar shall be packaged in food grade materials that ensure product safety and integrity.

8.2 The net weight of the packages for white sugar may be required to meet the relevant regulations of the destination country.

9 Labelling

In addition to the requirements of ARS 56, the following specific provisions shall apply:

- the name of the product as “plantation white sugar” or “mill white sugar” or “refined white sugar”;
- the net contents shall be declared by weight in the metric units ('Système International');
- the name, address and physical location of the manufacturer and/or the packer, distributor, importer, exporter or vendor of the product shall be declared; and
- the country of origin of the product shall be declared.

10 Method of sampling

10.1 General requirements for sampling

In drawing, preparing, storing and handling of samples, the following precautions and directions shall be observed.

- Samples shall be taken in a protected place not exposed to damp air, dust or soot.
- The sampling instruments shall be clean and dry when used.
- When sampling for microbiological purposes, the sampling instruments and containers for samples shall be sterilized preferably by dry heat at 170 °C for 1 h before use.
- Precautions shall be taken to protect the samples, the material being sampled, the sampling instruments and the containers for samples from adventitious contamination.
- The samples shall be placed in clean, dry, and moisture-proof containers.
- The sample containers shall be sealed air-tight after filling and marked with name of material, date of sampling, name of the manufacturer, name of the person sampling and such other particulars of the consignments.

- g) Samples shall be protected from light as far as practicable and shall be stored in a cool, dry place.

10.2 Scale of sampling

10.2.1 All the packages of the same size, type and style which have been manufactured and packaged under essentially the same conditions in a single consignment shall constitute a lot.. Samples shall be tested separately for each lot for ascertaining the conformity of the sugar.

10.2.2 The number of bags to be selected (n) from the lot shall depend on the size (N) of the lot and shall be in accordance with the formula:

$$n=\sqrt{N}$$

These bags shall be selected at random from the lot; to ensure the randomness of selection a random number table, as agreed to between the purchaser and the supplier shall be used. In case such a table is not available, the following procedure shall be used:

Starting from any bag, count them as 1,2,3,..... up to r and so on in one order, where r is equal to the integral part of N/n , N being the total number of bags in the lot and n the number of bags to be selected. Every r^{th} bag thus counted shall be separated until the requisite number of bags is obtained from the lot to give samples for test.

In case of bags stacked in a pyramidal shape, approximately equal number of bags shall be selected from all exposed sides of the lot, so as to give the required number of sample bags.

10.3 Preparation of sample

10.3.1 Procedure

From the top, middle and bottom portions of each of the selected bags (see 10.2), approximately equal quantity of sugar shall be taken with the help of a suitable sampling instrument. The sample collected from each of the bags shall be thoroughly mixed so as to give a composite sample of 600 g. The composite sample thus prepared shall be divided approximately into three equal parts; one for the purchaser, one for the supplier, and the third for the referee and sealed air tight with particulars as given in 10.1(f).

10.3.2 Number of tests

The composite sample prepared as under 10.3.1 shall be tested for the characteristics as prescribed in Table 1.

10.3.3 Criteria for conformity

The lot shall be declared as conforming to this specification, when the test results on various characteristics obtained on the composite sample satisfy the corresponding requirements.

11 Methods of test — Determination of pesticide residues

The pesticide residues shall be determined according to AOAC methods of analysis for pesticides. (970.52, 985.22, and 970.53 of 1990).

Bibliography

CODEX STAN 212:1999(Amd. 1-2001), *Standard for sugars*

EAS 5:2009, *Refined white sugar — Specification*

EAS 16:2010, *Plantation (mill) white sugar — Specification*

Nigerian Industrial Standard, NIS 90:2000, *Refined white sugar*

Nigerian Industrial Standard, NIS 383:2000, *Plantation white sugar*

WFP V1.1:2010, *Technical specification for white sugar*

PS 1822-2007, *Pakistan standard for refined sugar and white sugar*

Indian Standard, IS 1151:2003, *Refined sugar — Specification*

Indian Standard, IS 5982:2003(R2005), *Plantation white sugar — Specification*

